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THE CHEMICAL THERMOSCOPE.

We copy the following from the Scientific American for November 26; it describes the method of making a little instrument that is found in many houses and is frequently called a barometer, or sometimes a "weather indicator" or a chemical hygrometer. Probably all these names are quite inappropriate and misleading. The liquid within the glass is so sealed up that neither the pressure nor the moisture of the external air can have any influence upon it. It is really a form of thermoscope; the changes in the appearance of the liquid within the glass depend upon the temperature only and can have no more connection with future weather than the changes in a thermometer. A great many other combinations of chemicals dissolved in water, alcohol, coal oil, or other liquids can be constructed to show the rise and fall of the temperature, but an ordinary thermometer is, of course, much better. The Editor does not believe that the instrument described below can have any value, either as a thermometer or barometer, hygrometer or weather indicator. In one location or at one season of the year, it will predict clear weather, but a few hours later, when the temperature of the room changes, its own indications will change correspondingly, and it will predict rain or snow. Nevertheless, as many inquiries have been received, asking for the method of construction, we submit the accompanying with the special request that if any of our observers constructs one of these thermoscopes, he will kindly keep a record of its appearance at every daily maximum and minimum temperature for a month or more and study out its value as a weather prophet.

Dissolve 10 grammes of camphor, 5 grammes of saltpeter, 5 grammes of sal ammoniac, in 105 grammes of alcohol (90 per cent) and 45 grammes of distilled water. After filtering, fill glass tubes 2 centimeters wide and 50 centimeters long with this solution, cork up well below and above, seal and fix on boards by means of wire, similar to barometers. The changes of the solution signify the following: Clear liquid, bright weather; crystals at bottom, thick air, frost in winter; dim liquid, rain; dim liquid with small stars, thunderstorms; large flakes, heavy air; overcast sky, snow in winter; threads in upper portion of liquid, windy weather; small dots, damp weather, fog; rising flakes which remain high, wind in the upper air regions; small stars in winter on bright sunny day, snow in one or two days. The higher the crystals rise in the glass tube in winter, the colder it will be.

KITE WORK IN MADEIRA.

According to Nature, 1879, Vol. XX, p. 444, in the Report of the British Association for 1879, p. 63, will be found the Report of the committee on atmospheric electricity in Madeira, by Dr. M. Grabham, who gave himself to the observation of the regular winds and breezes and their connection with electrical phenomena. Of course, the kite was used for this purpose, and Dr. Grabham notes that—

The thinness of the currents of air constituting sea breezes was demonstrated in the bay of Funchal by flying a kite vertically beyond into the true wind blowing in a contrary direction. Abortive attempts were made to bring down the upper electricity through the lower currents. The electricity of the general northeast wind, which is identical with the trade wind, was found on the heights at the east end to be uniformly moderate and positive.

At the approach of the rain clouds at the termination of a period of fine weather, the atmosphere invariably gives increased readings, and no negative observations were recorded.

The kite is specially adapted to the study of the sea breeze, which usually constitutes but a thin layer of air, and should be applied by those who resort to the shores of our oceans and Great Lakes.

PROGRESS IN KITE WORK.

The October number of the Quarterly Journal of the Royal Meteorological Society contains an historical article by Mr. A Lawrence Rotch on the work done at the Blue Hill observatory in the development and use of the kite. In the discussions following this excellent article, Mr. R. C. Mossman gives an account of the work done by Mr. John Anderson, late of Owensboro, Ky., but now residing in Edinburgh, in flying kites at the latter city for meteorological purposes.

Capt. Baden Powell explained the construction and management of his form of kite. Mr. Rotch stated that the Baden Powell kites had been tried at Blue Hill, and that, although they started in a lighter wind than the Hargrave kites, yet they were not sufficiently stable in winds of varying velocity without using side lines, which precluded the attainment of great height.

Mr. R. C. Mossman stated that from work done by Prof. Michie Smith on the summit of Dodabetta, India, it was found that the electric potential on the edge of a dissolving mist is lower than the normal, while in a condensing mist it is higher than the normal. It is proposed to make observations on this point by the use of kites near Edinburgh, in order to ascertain whether the same phenomenon occurs in the free air as on the mountain tops.

ORIGIN OF TORNADOES.

Dr. B. F. Duke, of Pascagoula, Miss., sends an account of a tornado observed by him in April, 1894, possibly at or near that place.

I was located on the edge of a track about a mile and a half wide, within which nearly everything was swept before the wind. It was a cloudy day, and thunder and rain had been observed all the afternoon in the west under very dark clouds. About 6 p. m. these clouds suddenly became very black in one place while everything around the observer was very calm and still. Soon a terrific roaring could be heard in the distance. As it approached, a low stratum of muddy cloud could be seen in the west, flying from northwest to southeast, while another stratum was coming up equally fast from the south, and puffs of wind from these two directions were alternately felt by the observer. All this occurred a little in advance of the dense black cloud, which was streaked with lightning, though not funnel-shaped so far as we could discern. When it (the tornado?) had passed by us, it was seen that the timber on the north side of the track was blown to the southeast while that on the south side fell toward the north, but in the center, or nearly so, it was piled in every direction and in the greatest possible confusion. In some places the wind seemed to have made all sorts of breaks and deflections, blowing in strips of a quarter of a mile or more, directly opposite to the general course which was nearly northeast. In some of these dashes, if we may so speak of them, it (the wind?) would appear to have been heavier than in the main body of the storm.

What conditions of the earth and air give rise to the south and the northwest winds and the clouds that preceded the hurricane?

Is there not a strong attraction between them? When they meet, is not this affinity neutralized? Had these winds been coming from exactly opposite directions, would not the cyclone (tornado) have occurred throughout the whole length at the same moment? Does a tornado actually travel, or is its velocity to be reckoned by the acuteness, or obtuseness of the angle of these two approaching currents, which might be illustrated by two lines of battle advancing toward each other at the angle indicated, namely, one moving from south to north, the other from northwest to southeast; the time required for the two entire lines to meet depending upon the speed maintained?

In the United States when the weather map shows a center of low pressure, there is generally an extensive area of cold northerly winds and high pressure west of the center; but a region of warm southerly winds south and east of it. What conditions of the earth and air give rise to these winds? The only answer must be that the differences in density of different portions of the atmosphere cause these portions to be acted upon differently by the attraction of gravity and by the centrifugal force of the revolving atmosphere. Gravity pulls the denser air down, so that the cold northwest wind